Restoration Report for Five Year Monitoring Report

Monitoring Question - Have restoration and conservation activities been focused in priority watersheds identified by the WARS process?

The Watershed Aquatic Recovery Strategy (WARS) is a process that identifies subwatersheds according to the type (active, passive, or conservation) and priority (low, moderate, and high) of restoration needed among the 650 subwatersheds across the Southwest Idaho Ecogroup (i.e. Sawtooth, Boise, and Payette National Forests). Restoration is defined as the movement of subwatershed functions, ecological processes, and structures toward desired conditions. The basic concept is to improve watershed conditions when degraded and maintain these conditions if functioning appropriately. It is hoped that by focusing restoration in specific subwatersheds that forests could: (1) secure (i.e. reduce management impacts) subwatersheds with the best water quality, best fish and aquatic species populations, etc; (2) extend favorable conditions into subwatersheds adjacent to these high quality areas to create a larger and more contiguous network of suitable and productive habitats; and (3) restore soil-hydrologic processes to ensure favorable water quality conditions for aquatic, riparian, and municipal beneficial uses that will fully support beneficial uses and contribute to the de-listing of fish species and 303(d) water quality limited water bodies.

High priority subwatersheds were further prioritized to focus recovery efforts and provide a "blue print" as to which areas should be the highest priority for restoration or conservation during the planning period (next 10-15 years). ACS priority subwatersheds were identified for each subbasin to represent the "highest of the high" in terms of applying management direction and restoration prioritization, especially for short-term recovery objectives. This process is designed to focus management direction and restoration prioritization for the recovery of listed fish species, their habitats, and 303(d) impaired water bodies, and other Soil Water Riparian, and Aquatic resources.

Types of restoration considered – To account for what restoration has been completed in the last five years only certain projects were considered. Those projects that focused on maintaining or restoring soil productivity, quality and quantity of surface water resources, or environmental features that limit the biological capability of the particular water body (i.e. river, stream, lake, etc.) were included in the summaries below. For example, treatments that restored plant cover to prevent erosion, removed a barrier to improve fish passage, realigned a road to reduce sediment, or installed fencing to protect lakeshores vegetation and erosion were included. Many of these treatments have attempted to repair ecological damage and work toward re-establishing predisturbance conditions so that ecosystem processes can operate unimpeded over time.

Restoration Completed within WARS subwatersheds - Aquatic restoration can be measured by (1) How many projects were implemented; (2) How many acres or miles were accomplished; and/or (3) How many dollars were spent. From 2004 to 2008, 119 projects were complete that protected, maintained, or restored water resources, soil resources, stream habitats, and lake habitats and associated desirable species. These projects improved 62.2 miles of stream, 4,951.1 acres of riparian and upland areas, 15 acres of lake, and decommissioned 39.3 miles of roads/trails. Approximately $5,609,939 was spent on these projects, with the largest amount ($3,653,675 or 65%) going to fire related restoration. Projects focused in ACS priority subwatersheds accomplished 11.1 miles (17.8%) of stream, 15 acres (100%) of lake, and 3,841 acres (77.6%) of riparian and upland improvements over the five year period (Tables 1 and 2). Projects focused in WARS high priority subwatersheds accomplished 22.7 miles (57.8%) of stream, 13 acres (86.7%) of lake, and 2,857 acres (57.7%) of riparian and upland improvements on the forest (Tables 1 and 2).

Although ACS and WARS high subwatersheds are the highest priority for restoration, not all restoration projects implemented or dollars spent over the last five years have occurred in these subwatersheds. This is due to several reasons. First, some of the aquatic restoration projects implemented in the early part of this monitoring period were planned under the previous forest plan or past planning efforts before the revised plan was released. These projects were not planned with more recent forest-wide, management area objectives or WARS emphasis in mind. Second, many restoration projects are driven by specific resource issues that must be addressed immediately or additional degradation may occur (i.e. sediment coming from damaged roads or trails, post-fire related rehabilitation, etc.). Third, WARS recognized the need to invest in projects that could improve conditions into subwatersheds adjacent to the high quality areas or in 303(d) water quality limited water bodies. Some of these are in low and moderate priority subwatersheds. Fourth, restoration projects may be driven by outside groups that have a specific interest in an issue or aquatic resource that falls outside of ACS priority subwatersheds. Finally, many subwatersheds were designated as high priority because they still retain important native fish species. Many of the subwatersheds are still in relatively good condition and do not have as many restoration opportunities to invest in as lower priority areas. Even with these considerations, the projects implemented still addressed many key forest wide or management area objectives in ACS or high priority subwatersheds (Table 1).

Table 1 – Restoration completed in WARS priorities from 2004-2006

	2004				2005				2006			
		Outside ACS Priority Watersheds				Outside ACS Priority Watersheds				Outside ACS Priority Watersheds		
	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority
Total Miles of Stream Improved	0	0	6 (55%)	5 (45%)	2.5 (25.5%)	4.5 (45.9%)	5.3 (54.1%)	0	2.6 (22.8%)	9.2 (80.7%)	0	2.2 (19.3%)
Total Acres of Lake Improved	5 (100%)	5 (100%)	0	0	0	2 (100%)	0	0	5 (100%)	5 (100%)	0	0
Total Acres of Watershed Improved	154.8 (55.4%)	224.8 (80.5%)	1 (0.4%)	53.6 (19.1%)	23 (17.6%)	28 (21.4%)	50 (38.2%)	53 (40.4%)	263 (99.3%)	2282.5 (86.1%)	51 (1.9%)	368.5 (12.0%)

Table 2 – Restoration completed in WARS priorities from 2007-2008

	2007				2008				Total (2004-2008)			
		Outside ACS Priority Watersheds				Outside ACS Priority Watersheds				Outside ACS Priority Watersheds		
	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority	Within ACS Priority	WARS *High* Priority	WARS *Mod* Priority	WARS *Low* Priority
Total Miles of Stream Improved	2 (16.7%)	3 (25.0%)	8 (66.7%)	1 (8.3%)	4 (22.2%)	6 (33.3%)	3 (16.7%)	9 (50.0%)	11.1 (17.8%)	22.7 (36.5%)	22.3 (35.9%)	17.2 (27.6%)
Total Acres of Lake Improved	2 (100.0%)	0	0	0	3 (100%)	1 (33.3%)	0	2 (67.7%)	15 (100%)	13 (86.7%)	0	2 (13.3%)
Total Acres of Watershed Improved	222 (41.0%)	65 (12.0%)	15 (2.8%)	461 (85.2%)	809 (62.3%)	257 (19.8%)	150 (11.6%)	891 (68.6%)	3,841 (77.6%)	2,857 (57.7%)	267 (5.4%)	1,827.1 (36.9%)

Specific Restoration Project Examples (2004 to 2008)

It is never easy selecting which of the 119 projects to show case when there are so many outstanding examples. In choosing projects I have tried to represent some of the diverse projects the forest has completed in the last five years. Seven projects (Stanley Creek Road 653 Realignment, Stanley Lake Inlet Recreation Fence, Cover Creek Riparian and Road Rehabilitation see separate attached reports) and (Lower Rock Creek Restoration, Big Water Gulch Culvert Removal, Eight Mile Fencing Project, and Castle Rock Hillslope Treatments described below) represent some of the unique accomplishment, challenges, and lessons the Sawtooth National Forest has learned in this evolving restoration program.

Lower Rock Creek Restoration - With support of Idaho Department of Environmental Quality and Idaho Department of Fish and Game, several dispersed campgrounds were relocated and campsites closed. Dispersed campgrounds were expanding, increasing soil compaction, impacting riparian vegetation, and increasing streambank instability along Rock Creek (Figure 1). Phase I of the project physically closed (barrier fences and rock) and relocate sites in 2007, while determining acceptance of the public. Phase II treated invasive species and planted localized areas with native species within the closed campsites. As of 2008, streambank stability and riparian vegetation had improved in localized areas along Rock Creek. Willows had begun to sprout within roads and through rock blankets that were placed to deter use (Figure 2). In time this project should improve and water quality as sediment and bacteria from human waste is reduced.

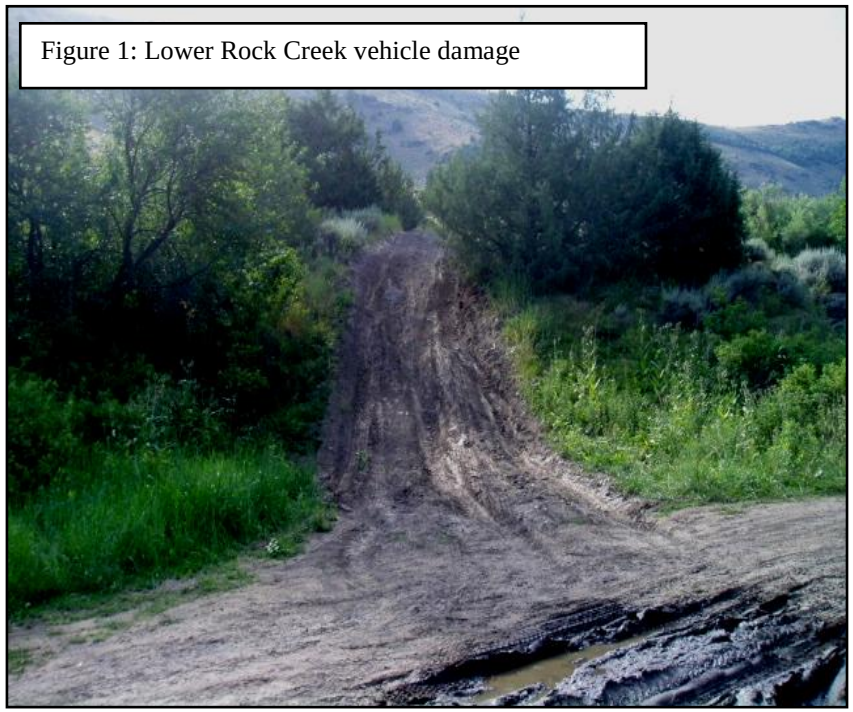


Figure 1: Lower Rock Creek vehicle damage

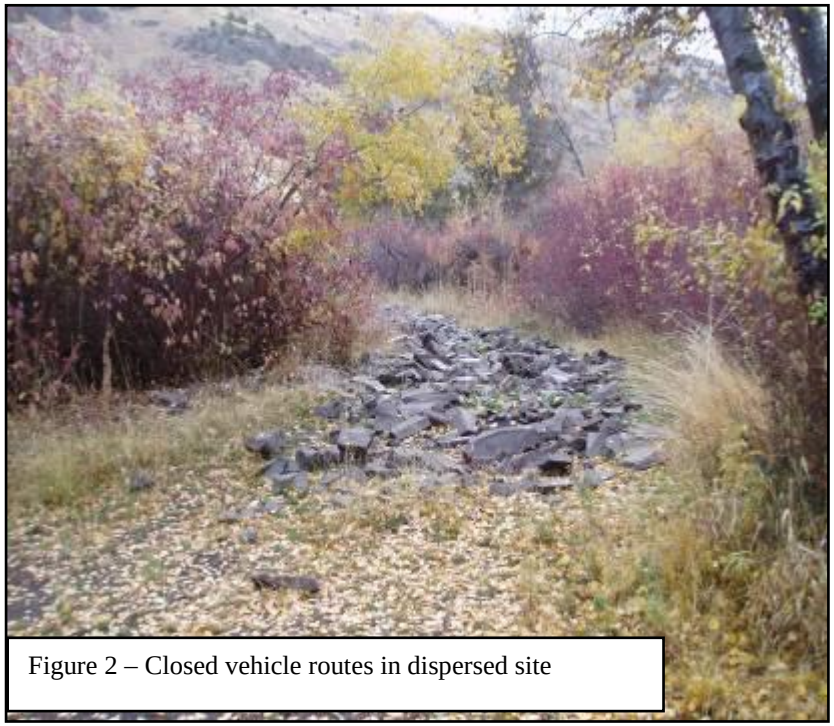


Figure 2 – Closed vehicle routes in dispersed site

Big Water Gulch Culvert Replacement - The Big Water Gulch Creek barrier culvert was replaced with a countersunk round corrugated steel pipe designed to assure upstream passage by adult and juvenile bull trout and other native aquatic organisms and to pass the 100-year flood event (Figures 3 and 4). An excavator was used to construct the culvert and a temporary bypass road to allow traffic to pass uninterrupted on the 227 road. This project has helped to improve connectivity and habitat conditions (e.g. less chronic sediment deposition downstream) for aquatic organisms in Big Water Gulch Creek. However, other factors such as warm water temperatures and low flows caused by diversions upstream may inhibit fish from fully utilizing the improved passage. These other limiting factors are being address under the special use permit for the diversions. Once these factors are addressed, two miles of Big Water Gulch Creek should be accessible to fish and other aquatic organisms. Replacement of the culvert has improved the chances for wandering subadult bull trout to move upstream into cooler headwater habitat in Big Water Gulch.

Figure 3 – Reconstructed channel above culvert

Figure 4 – countersunk culvert and natural stream bottom

Eightmile Spring Protection Project

Eightmile Creek is one of the few streams in the Blackpine Division that supports a pure strain of Yellowstone cutthroat trout. Cattle grazing had compacted and over grazed the Eightmile spring (Figure 5) which produces all of the perennial flow to the three miles of habitat below. In an effort to protect the spring and the fish population, a small protective exclosure around the spring was constructed in 2007. A standard pole and barbed wire fence was built around the spring. Adjustments were also made to the grazing permit to make the riparian pasture into a riparian exclosure...livestock will no longer have access to graze the lower stream corridor or headwaters. The headwaters and surrounding wetlands as well as the lower portion of Eightmile Creek have return to an improved ecological condition at a more rapid rate with the exclusion of livestock (Figure 6).

Figure 5 - Improved Eightmile spring and wetland

Figure 6 – Improved spring and wetland in 2008

Castle Rock Fire Hillslope Treatments – On August 16, 2007 a lightning storm crossing the Sawtooth National Forest ignited a fire near Castle Rock Peak, southwest of Ketchum, Idaho. The fire escaped initial attack efforts and burned into dense Douglas fir, grass, and sagebrush and by the third day was 600 acres. The fire was 100% contained on Tuesday, September 4, 2007 after burning 48,520 acres on the Sawtooth National Forest, and lands managed by the Bureau of Land Management and the Idaho Department of Lands.

Figure 7 – Homes below a burned micro-drainage

In June 2008 approximately 188 acres of agricultural and 195 acres of wood straw mulch were treated via aerial application in seven treatment units ranging in elevation from 5,880 ft. to 8,520 ft. Treatments were intended to protect life and property downhill of burned slopes (Figure 7) by reducing the potential for erosion, sedimentation, and debris flow initiation. Mulching would reduce downstream peak flows by absorbing and slowly releasing overland runoff which was likely to increase due to reduced soil cover and hydrophobic soil conditions. Mulching would also help to protect the native seedbeds and retain moisture on the burned slopes to facilitate faster vegetative recovery of the treatment areas. Mulching treatments in the headwaters location would protect larger areas downslope from cumulative runoff and sedimentation.

Monitoring found that approximately half of the treated areas still had adequate straw coverage 14 months after application. Areas with the best remaining coverage were predominantly treated with wood straw except for a portion of the Board Ranch South treatment area. Very few sites in 2009 still retained agricultural straw (Figures 8 and 9). Straw that remained occurred mainly behind large rocks, trees, low lying shrubs, shallow depressions, or other protected areas of each unit. Sites where ground cover increased were due to more vegetative recovery and litter/duff from sage brush or dead cheatgrass than straw mulch.

Mulch did not reduce vegetative ground cover in any of the treated areas. Grass, forbs, and small woody species were able to easily grow through the wood and agricultural mulch. Only a few sites in the Hot Springs North unit had excessive clumping that inhibited regrowth of grasses and forbs.

Figure 8 – Portion of Hot Springs North after treatment

Figure 9 – Same area Hot Springs North in 2009

It was difficult to determine how much mulch reduced runoff and rill erosion on south facing slopes since none of the burned hillslopes were subjected to high intensity rains in 2008 when ground cover was still sparse and hydrophobicity was higher. By the time heavy rains arrived in 2009 grasses and forbs had recovered on most of the south facing slopes leaving less exposed soils to erode. Mulch did appear to help minimize rill erosion and debris flow initiation on the north facing slope since much of the straw coverage remained intact 14 months after application. This helped retain soils and enable regrowth of grasses and forbs.

Although straw coverage decreased at most sites, it is still providing some ground cover. This coverage has helped to protect hillslopes especially at the wood straw sites until enough revegetation took place. In hind sight, it would have been better to treat all areas with wood mulch since this product lasts much longer than agricultural straw. This is especially true on north facing slopes that burned hotter and still do not have adequate vegetative ground cover nearly two years after the fire. Costs would have been much higher (another $600,000) to complete the entire project with wood mulch. It would have also taken longer for the contractor to acquire enough mulch to treat the entire project area, potentially delaying the project by several weeks. However, these issues must be weighed against the values and post-fire risks that these treatments are intended to minimize. The BAER assessment concluded these risks were very high to life and property immediately downslope of the fire. So any additional protection would have been worth the higher costs. However, in areas were risks to life and property are lower less costly treatments should be considered.

Restoration Implemented within TMDL and 303 (d) Streams (SWOB05 and SWOB06) - Idaho Department of Environmental Quality (IDEQ) routinely monitors Idaho's waters through the Beneficial Use Reconnaissance Program (BURP) and assesses water quality using methods described in their Water Body Assessment Guidance (WBAG). Each year the BURP program sends crews to collect water temperature data, biological samples (e.g., fish, bacteria), chemical measures (e.g., specific conductivity, the ability of water to pass an electrical current), and habitat data from Idaho's surface water. The collected information is used to determine whether beneficial uses are being supported in Idaho's streams, rivers, and lakes.

Using BURP and other data and the methods described in the (WBAG), DEQ determines if each of Idaho's water bodies meets water quality standards and supports beneficial uses. DEQ submits an "Integrated Report" to EPA every two years that identifies and prioritizes the state's water quality problems. This report is based on the data collected through DEQ's monitoring programs and serves as a guide for developing and implementing plans to protect beneficial uses. This report provides an overall assessment to the forest to gauge how well water quality and beneficial use are being maintained on water bodies within forest administered boundaries.

Total daily maximum loads (TMDLs) assessments have also been completed throughout most subbasins across the forest. When biological data indicated that beneficial uses were not fully supported, water chemistry data were used to identify the source of pollutants impacting beneficial uses. Once a pollutant was identified, load allocations for the appropriate point and nonpoint sources were completed for specific water bodies. Every waterbody within the subbasin has to meet the specifications for those pollutants defined in the TMDL whether they're listed on the 303(d) list or not.

The forest has completed a number of projects within 303 (d) streams and subbasins with TMDLs. Some of these projects have been designed to address specific pollutants of concern (i.e. sediment, suspended sediment, nutrients), while others were driven by other restoration objectives or partnership opportunities. Restoration completed from 2004 to 2008 within 303 (d) listed impaired (based on Idaho's 2002 integrated report) or TMDL waters are summarized in Table 3. A little less than 50% of all stream restoration and road decommissioning completed in the last 5 years has been focused in streams with a TMDL or 303 (d) designations. Much of the stream restoration has focused on improving fish passage, reducing erosion along designated campsites, installing fences to reduce trampling by livestock, re-establishing stream flows by fixing diversions or installing woody debris to increase fish habitat. While not all of these projects have addressed a pollutant for which the stream was listed, they have helped to reduce sources of impairment and improve overall aquatic health. Projects completed within upslope areas or along roads/trails have addressed impacts to riparian vegetation and streams from fires, roads, trails, and dispersed campsites. Many of the projects have helped to reduce sediment sources or improve riparian vegetation in areas that are currently impaired for stream temperature or siltation/sediment. However, the forest

needs to continue to look for restoration opportunities that complement recommendations made in TMDL assessments and implementation plans when every possible to more fully meet our commitments under the Clean Water Act.

Table 3 – Restoration completed within TMDL or 303 (d) subwatersheds

Category	2004-2008	Percent of Total Restoration Completed from 2004-2008
Total Miles of Stream Improved	28.95	46.5%
Total Acres of Lake Improved	0	0
Total Acres of Watershed Improved	1024.5	20.7%
Miles of Road Decommissioning	11.5	47.9%
Dollars Spent	$957,719	17.1%

The Sawtooth National Forest has also participated in several watershed advisor groups providing input on five year TMDL reviews, TMDL implementation plans, and projects submitted for 319 grants.

IDEQ completed and submitted its 2008 Integrated Report to EPA for review and approval in July 2008. IDEQ received a partial approval/partial disapproval of the 2008 Integrated Report from EPA on February 4, 2009. This new report has updated the 303 (d) listed impaired water designations made in the 2002 integrated report and will serve as a basis for what restoration is completed by the Sawtooth National Forest within impaired waters in 2009 and beyond.

SWOB11 - Coordinate with state and local agencies and tribal governments annually to limit or reduce degrading effects from stocking programs on native and desired non-native fish and aquatic species.

In the last five years the Sawtooth National Forest has coordinated with Idaho Department of Agriculture and Fish and Game on several issues related to the stocking of non-native fish species. The Sawtooth National Forest participated in several meetings with Idaho Fish and Game and Utah Department of Wildlife Resources. Stocking in high mountain lakes across the forest was one of the topics discussed with the Magic Valley, Salmon, and Southwest Idaho Fish and Game (IDFG) regional offices. Stocking frequency, stocking databases, common naming convention for lakes, and roles and responsibilities were discussed.

In 2004, the forest participated in the Northwest Power and Conservation Council subbasin assessments in Boise-Payette-Weiser and the Salmon River to characterize threats from stocked species and identified restorative actions that could be taken to reduce these threats at the subbasin scale.

In 2009, the Sawtooth National Forest was one of several forests that provided comments on Idaho's rules (IDAPA 02 TITLE 06 CHAPTER 10 02.06.10) for governing invasive species. Forests recommended that walleye, lake trout, and brook trout be included as invasive species because they have a high potential to impact native fish populations. Unfortunately, Idaho Department of Agriculture did not adopt this recommendation due to the recreational value of these fish species.

IDFG has also enacted several regulatory mechanisms to help minimize threats to native fish populations from stocked fish. Some of these actions taken include:

(1) Cessation of the Department's brook trout stocking program in native trout streams.

(2) Allowing anglers a bonus harvest of brook trout in addition to the existing trout limit.

(3) Sterilization of rainbow trout used for most stocking to prevent hatchery trout from hybridizing with wild trout. Since 1999, it has been the policy of IDFG to stock waters with native fish species with only rainbow trout from eggs that were heat-shocked to produce sterility, thus reducing fish stocking as a source of hybridizing rainbow trout. The Department will stock only sterile non-reproducing fish unless there is a need to supplement wild/ natural stocks with reproducing fish.

The IDFG management direction, as described in its Fisheries Management Plan, gives priority in management decisions to wild, native populations of fish. In addition, IDFG will continue to evaluate its alpine lake management based on the following guidelines:

1. Where desirable and feasible, some lakes will be maintained as fishless.
2. Management of alpine lakes in wilderness and national recreation areas will be coordinated closely with the appropriate land management agencies.
3. Self-sustaining native trout populations will be maintained.
    - Determination of a lake's capability of providing natural reproduction will be made when the lake is surveyed. Stocking will be modified or eliminated to reduce the detrimental effects of adding more fish on top of existing populations and to reduce costs.

- Species of special concern, native species, and threatened and endangered species within alpine lake drainages will be given management priority.
- Priority will be placed on management of alpine lakes to reduce or eliminate impacts to native species in and downstream from alpine lakes. In these drainages, sterile fish may be stocked to eliminate potential interbreeding with native fish in the system.
- Self-sustaining populations of non-native species may be reduced where feasible, to achieve native species goals or other fish management goals.
- Brook trout and other non-native fish can negatively impact native fish populations. When desirable, management will be directed towards reducing or eliminating non-native fish populations that are impacting native fish by utilizing regulations or population management actions.

SWOB16 - During fine-scale analysis, identify opportunities to restore degraded upland and aquatic habitat conditions in order to support productive and diverse populations of native and desired non-native aquatic species to meet social needs and tribal interests. Opportunities should focus on restoring passage for fish and other aquatic species, and restoring desired ranges of water temperature, large woody debris, streambank stability, sediment levels, water chemistry, and pool size and numbers.
TEOB09 - As funding allows, implement restoration activities in accordance with the current Watershed and Aquatic Recovery Strategy or Forest Service-approved portions of recovery plans to:

a) Restore listed fish species distribution,
b) Restore desired habitat conditions,
c) Conserve genetic diversity, and
d) Provide for genetic exchange.

Numerous projects whose objective was to reduce sediment, improve fish passage, improve bank stability, wood debris, and pools were completed across the forest. Accomplishments are reflected in Appendix A.

SWOB18 - Reduce road-related effects on soil productivity, water quality, and aquatic/riparian species and their habitats. Refer to the Watershed and Aquatic Recovery Strategy (WARS) for mid-scale prioritization indicators to assist in fine and site/project scale restoration prioritization planning.

Approximately 37 road restoration projects have been implemented over the five year monitoring period that address water quality and aquatic habitat issues (Table 4). These projects decommissioned 39.3 miles of roads/trails, 451.8 acres of riparian and upland areas,

and improved fish passage on 10 miles of stream. Approximately $447,380 (8% of dollars represented in Tables 1 and 2) was spent on these projects. Projects focused in WARS and ACS high priority subwatersheds accomplished 33 miles (89.2%) of stream and 431.3 acres (95.5%) of riparian and upland improvements on the forest and spent $324,663 (72.6%). These projects are in addition to the 600 miles of annual road maintenance completed across the forest that addresses drainage and erosional problems.

TEOB03 - Identify and reduce road-related effects on TEPC species and their habitats using the Watershed and Aquatic Recovery Strategy and other appropriate methodologies.

Approximately 21 road restoration projects have been implemented over the five year monitoring period that address water quality and aquatic habitat issues (Table 4). These projects decommissioned 25.5 miles of roads/trails, 167.3 acres of riparian and upland areas, and improved fish passage on 6 miles of stream. Approximately $243,069 (4% of dollars represented in Tables 1 and 2) was spent on these projects. These projects are in addition to the 600 miles of annual road maintenance completed across the forest that addresses drainage and erosional problems.

Table 4 – Road restoration accomplished on the Sawtooth National Forest from 2004-2008

Project Name	Subwatershed where restoration occurred	Summary of work accomplished	Cost	Target	WARS Designation	ACS priority subwatershed
Non-System route decommissioning	**Miller-Bowns-Salt** **Boardman** **Upper Willow Creek**	Project decommissioned/obliterated user-created roads and trails that have not been designated as official travel routes.	$5,618	3 acres and 1 mile in Upper Willow 6 acres and 2 miles rd decom. each in Miller-Bowns-Salt and Boardman	Active/Mod Passive/High Active/Low	No Yes Yes
W. F. Warm Springs Road Restoration (WFW3)	**Warfield-West FK Warm Springs**	Road surface grading and drainage were improved along approximately 1 mile of road.	$3,947	7 acres	Active/Low	Yes
SF/MF Warm Springs Creek road and trail rehabilitation	**Upper Warm Springs Creek**	Project modified portions of roads, trails, and fords in the Middle and South Fork Warm Springs Creek drainages to reduce erosion and stream sedimentation.	$5,062	5 acres, 1 mile rd decom	Active/High	No
Cove Creek undesignated route	**Cove Creek**	Project decommissioned/obliterated user-created roads and trails that have not been designated as official travel routes.	$5,785	15 acres, 5 miles rd decom.	Active/High	No

decommissioning						
Castle Rock Roads (BAER)	**Warfield-West FK Warm Springs**	One culvert on Ketchum-Featherville Road was installed to improve ditchline drainage.	$1,150	1 acre	Active/Low	Yes
Black Pine 2 – Roads (BAER)	**Sweetzer Canyon-Meadow** **Pole Canyon** **East Dry-Burnt Basin** **Rice Canyon Creek** **West Dry-Eightmile-Fisher**	Work included road drainage, grade control structures, and installation of a berm	$31,305	19 acres	Active/Low Passive/Low Passive/Low Active/Low Active/High	No No No No Yes
Trout Creek channel stabilization and road relocation	**Trout Creek**	The main road was relocated and a headcut stabilized in Trout Creek where stream had over several years eroded onto the existing road.	$10,709	11 acres	Active/Mod	Yes
Bear Hollow Road obliteration and reclamation.	**Upper Goose**	Several miles of trail and roads were obliterated and in Bear Hollow.	$3,788	4 acres, 1.5 miles rd decom.	Active/High	Yes
Blackpine Road Rehab (WFW3)	**Sweetzer Canyon-Meadow**	Several miles of road were reconstructed in Sweetzer Canyon after a debris flow from the Black Pine 2 fire impacted it in 2007.	$25,000	2 acres	Active/Low	No
Travel Plan Maintenance	**Beaver Creek**	Implemented vehicle control and site rehabilitation measures where expanding recreation use is not appropriate or desired.	$2,189	10 acres	Active/High	No
Beaver Creek Unauthorized Road Obliteration	**Beaver Creek**	Project obliterated up to 5 miles of unauthorized road (and associated dispersed recreation sites).	$12,278	20 acres	Active/High	No
Valley Road Fire Road Work (NFN3)	**Fourth of July Creek** **Fisher Creek**	Ten miles of road prism were reconditioned in Fisher and Fourth of July Creeks.	$5,000	30 acres	Active/High	Yes
Travel Plan Maintenance	**Stanley Lake Creek**	The extensive mortality of lodgepole pine forests within the Sawtooth Valley has accelerated an already persistent resource threat of user pioneered vehicle tracks, and expanding dispersed campsites. Such networks expand exponentially as	$6,000	10 acres	Active/High	Yes

		each lead opens new opportunities for others. Project implement utilized heavy equipment to implement barriers (rocks or debris) of new vehicle paths established by users through areas closed and inappropriate for travel, and at the perimeters for expanding dispersed campsites. Full recovery of these yet lightly used routes is expected.				
Job Creek Road	**Job Creek**	Project relocated the Job Creek Road to an upland location and removes approximately 0.2 miles of the former alignment fill from a wetland near Stanley lake Creek. Heavy equipment (excavator, dump trucks, etc.) where used to remove 235 truckloads of fill associated with the former alignment, and return it to the original upland source. A short reroute was constructed in uplands to replace this alignment. Wetland functionality is expected to return where altered for over 80 years.	$10,000	12 acres	Active/High	Yes
Vat Creek Unauthorized Road	**Vat Creek**	Funds obliterate approximately 1 mile of unauthorized road in the Vat Creek drainage.	$2,620	5 acres	Active/High	No
Alturas Unauthorized Road Obliteration	**Alturas Lake Creek**	Project obliterated unauthorized roads in the Alturas Lake Creek watershed. An excavator and back-hoe were used for road and campsite obliteration, to break soil compaction, to install barrier rock, to re-establish vegetation, and to accelerate restoration. In all, 3.7 miles of road and numerous campsites were obliterated.	$11,737	22 acres	Passive/High	Yes
Green Canyon Fire road drainage reconstruction (BAER)	**Warm Springs Creek**	The purpose of these treatments is to restore road drainage by reconstructing and constructing drainage dips along the Green Canyon Road to decrease the chance of failures in a narrow canyon with no turnouts.	$2,928	2 acres	Passive/High	No
Emma Creek Road Fords	**Emma/Axolotl**	Fords on FR 079 road of lower Emma Creek were reconstructed to reduce sedimentation of bull trout habitat.	$3,877	1 mile	Active/High	Yes
Copper Creek Road and Riparian Rehabilitation	**Copper Creek**	Project decommissioned riparian and valley bottom roads near Copper Creek and two tributaries, while maintaining trail access to the stream corridor. Approximately 2.8 miles of system road and 100 yards of the non-system road near the mouth of Blackspar Canyon Creek were decommissioned.	$8,500	8.5 acres	Active/Low	No
Valley Road Fire – Road Drainage Improvements	**Fourth of July and Fisher Creeks**	Treatments increased culvert capacities to accommodate increased water flows and associated bedload and debris, and restore road template drainage. Six drivable dips were	$27,845	5 acres	Active/High	Yes

		constructed, six culverts were replaced, and one new culvert was installed. Other work included the maintenance of existing drainage structures to bring them to current standards in response to the burned conditions.				
Cabin Creek Restoration at Luther Heights Road	**Cabin-Vat**	The purpose of this particular project was to restore Cabin Creek where captured by an informal back entrance to the Luther Heights Organization Camp. The project used an excavator to establish plugs in six separate channels of Cabin Creek using natural/bioengineering methods, and to restore the former natural cross-drain channels of Cabin Creek. Improved passage for salmonids is expected in Cabin Creek, as well as improved water quality, and habitat conditions. Improvements would also be expected in lake habitats in adjacent Perkins and Alturas Lakes.	$2,000	1 mile and 0.5 acres	Active/High	No
Vat Creek Meadow Road Obliteration	**Cabin-Vat**	The user-created roads in Vat Cr. were not engineered, designed, nor constructed for forest access, resource protection, or visitor safety. A roads analysis of the area identified these roads as contributing to resource damage while providing few benefits to forest visitors. In addition, some routes occur within the Smoky Mountain Inventoried Roadless Area. The purpose of the project is to obliterate numerous roads from the seasonal wetland and associated uplands and to restore vegetation and drainage in the area. An excavator and back-hoe were used road obliteration, to break soil compaction, re-establish natural drainage, and accelerate restoration. Four miles of road was removed in the vicinity of Vat Creek Meadow. Due to the seasonally wet conditions in much of the area, vegetation is expected to quickly recolonize the former roadbed. Soil, water, and wildlife will benefit when vehicular traffic is removed, erosion is reduced, and the meadow returns to a more natural state.	$8,000	0.1 miles; 4 miles road decom.	Active/High	No
Blair Cabin Meadow Road Obliteration	**Cabin-Vat**	Field surveys documented some portions of the roads in the Blair Cabin Meadow as having high erosion potential with as much as 40% of the road being wet during all seasons. A roads analysis of the area identified this road as contributing to resource damage while providing few benefits to forest visitors. The road within this seasonal wetland was obliterated	$5,000	0.1 miles	Active/High	No

		and vegetation and drainage restored. An excavator and back-hoe were used to break soil compaction, re-establish natural drainage, and accelerate restoration. One mile of road was removed.				
Sawtooth NRA Travel Plan Maintenance	**Alturas Lake Creek** **Cabin/Vat Creek** **Pettit Lake Creek**	The extensive mortality of lodgepole pine forests within the Sawtooth Valley has accelerated an already persistent resource threat of user pioneered vehicle tracks. Such networks expand exponentially as each lead opens new opportunities for others. The Sawtooth C&M crew used heavy equipment to construct barriers (rocks or debris) on new vehicle paths established by users through areas closed and inappropriate for travel.	$2,600	0.5 miles; 10 acres	Passive/High Active/High Passive/High	Yes No No
Upper Alturas Transportation Modifications	**Alturas Lake Creek**	The purpose of the project was to halt deteriorating conditions of Road 205 and Alpine Creek occurring at the Alpine Creek ford. During the previous decade deteriorating conditions upstream of the ford resulted in the capture of Alturas Lake Creek within a ¼ mile segment of Road 205, immediately above the ford. This situation was addressed in 2000 with the return of flows to the natural channel. However, it was also recognized that a similar scenario was soon to occur at the Alpine ford without intervention. As a result the initial planning effort was expanded to include the comprehensive changes need to maintain healthy landscape functions and sustainable road and trail infrastructure in the upper Alturas Lake Creek drainage. The result of this planning effort was a revised transportation system in Upper Alturas Creek. In FY06 the Mattingly and Alpine Creek Trailheads were consolidated and relocated to a new location below Alpine Creek; a new trail bridge was constructed; ½ mile of former trail no longer needed was obliterated and rehabilitated; and the former vehicle ford through Alpine Creek, including ½ mile of approach on either side of the ford was closed and rehabilitated.	$36,600	1 mile; 2 acres	Passive/High	Yes
Cove Creek Riparian and Road Rehabilitation	**Cove Creek**	Removed 2 miles of degraded floodplain road from Cove Creek. Public access was maintained and improved with the construction of about 2 miles of native-surface road in upland habitat upslope of and roughly parallel to the floodplain road. Six vehicle fords were decommissioned, reducing turbidity.	$20,000	2 miles	Active/Moderate	No

Eureka Gulch Road to Trail Conversion	**Alturas Creek**	The project reduced the existing poor condition two-track roadway to a single track recreation trail. One tread of the existing roadway was rehabilitated, where possible, by breaking compaction and incorporating adjacent forest large and small wood. The project is expected to resolve the persistent erosion and sedimentation that has affected two mile of stream. It has also re-connected 10 tributaries that had been captured by the roadway.	$4,000	2 miles	Passive/High	Yes
Almo	**Almo Creek** **Onemile Creek**	Road rehab on Ranger Trail to remove road and 50 acres for One Mile Creek rehab due to flooding	$1,975	50 acres 50 acres	Passive/High Active/High	Yes Yes
Bassett Gulch AML Cleanup	**Warfield-West Fork Warm Springs**	Rehabilitation of mining roads	$20,000	50 acres	Active/Low	Yes
WC Park - Parker Gulch Road Reclamation	**Elkhorn Creek**	Reclaim approximately 1/2 mile of road located in the Parker Gulch riparian area. This will include creating and defining a small parking area at the road terminus. Wildlife, water/soil resources will benefit as well as recreation with improved travel plan management and parking area for the public.	$1,773	1.5 miles of road or 3.6 acres	Active/Low	No
WC WS	**Upper Warm Springs Creek**	This project is intended to more effectively manage the effects of dispersed recreation to improve riparian conditions. Poorly located or unneeded roads and campsites will be reclaimed or redesigned and defined as needed to improve riparian areas. Camping will be allowed at designated sites only from the Forest Boundary near Ketchum to Placer Cr. approximately 25 miles from Ketchum.	$9,669	100 acres	Active/High	No
Travel Plan Maintenance	**Sawtooth Valley**	Funds would utilize the Sawtooth C&M crew to implement control measures of new vehicle paths established by users through areas closed and inappropriate for travel. Recent developments associated with the turnover of the lodgepole pine forests of the Sawtooth Valley have accelerated an already persistent resource threat of user-pioneered vehicle tracks. Such networks expand exponentially as each lead opens new opportunities for others. Therefore, a response is most appropriate and effective if addressed as soon as possible after the new track is first noted.	$4,172	20 acres	Active/High	No

Ford Rehabilitation Habitat Enhancement Project	**Upper Little Smoky**	Ford Restoration in Upper Little Smoky Creek. Project will reduce erosion and sedimentation during spring run-off and facilitate fish passage. Little Smoky Cr., the 096 road has captured about 50 ft of the creek. Excavation of an alternate channel on the downstream side of road would allow ford to only be about 10 ft wide.	$2,750	1 mile of stream	Active/Moderate	No
Ford Rehabilitation Habitat Enhancement Project	**Basalt Creek**	Ford Restoration in Basalt Creek. Project was designed to reduce erosion and sedimentation during spring run-off and facilitate fish passage. Basalt Cr. near Sawmill Gulch confluence is a non-system road that travels about 50 ft through the creek. Culverts and fill in Sawmill Gulch would allow vehicles to cross this stream and access a system road, avoiding a Basalt Cr. crossing entirely.	$2,813	2 miles of stream	Active/Moderate	No
Soldier Creek – Bridge Installation	**Upper Soldier Creek**	Bridge was designed to encompass the bankfull flow on the main S.F. Soldier channel, which should pass sediment and woody debris. It has also restored upstream fish passage.	$82,881	5 miles of stream	Passive/Low	Yes
Alpine Creek Ford Restoration	**Alturas Lake**	Funds would utilize the Sawtooth C&M crew to implement restoration of Road 205 ford through Alpine Cr. Ford rehab, trail bridge, trailhead construction	$78,809	2 miles of road or 4.8 acres	Active/High	Yes
Stanley Creek Road Realignment and Crossing Rehabilitation	**Stanley Creek**	Wetland Restoration and Road Realignment in Stanley Creek. Project was designed to reduce annual road damage from high flows; reduce sedimentation; and restore 1 acre of wetland/floodplain in Stanley Creek.	$9,000	1 mile of stream and 1 acre of wetland	Active/Moderate	No

SWOB19 - Identify and capitalize on funding opportunities to assist in the restoration of aquatic habitat and watershed conditions important to the recovery of listed fish species and de-listing of 303(d) impaired water bodies. Examples of potential funding sources include the State Clean Water Act 319 funds, Federal Columbia River Power System Re-licensing funds, and funds from the Northwest Power Planning Council, public and private partnerships.

A number of restoration projects with partnership funding have been implemented in streams supporting listed fish species or in 303(d) streams. From 2004 to 2008 approximately $410,000 has been contributed by partners through direct cash and in-kind (e.g. materials, etc.) contributions. Some of these partners have included Custer County Soil and Water Conservation District, Wild Turkey Federation, Idaho Departments of Fish and Game, Camas County Conservation District, Trout Unlimited, Challis High School "Envirothon" club, Idaho Department of Parks and Recreation, Magic Valley Flyfishers, National Smoke Jumpers Association,

Figure 10 – Log fencing along Redfish Lake

Sawtooth Society, and Idaho Department of Transportation. A few examples of these partnership projects include the fences along shorelines of high use recreational lakes on the SNRA (Figure 10), willow planting along the Salmon River, and road relocations (Figure 11) along Trout Creek on the Cassia Division on the Minidoka R.D.

Figure 11 – Road removal along Trout Creek

TEOB10 - Over the planning period, initiate habitat restoration for at least two subpopulations of anadromous fish and two populations of resident fish in each subbasin where these species occur. Use the current Watershed and Aquatic Recovery Strategy (i.e., WARS), or Forest Service approved portions of recovery plans, to assist in determining watershed priorities for habitat restoration within a subbasin.

NOAA Conservation Recommendation #4 - "Over the planning period, the Forest Service objective for fish habitat restoration should be to move at least two ACS Priority Subwatersheds per subbasin into a "functioning appropriately" condition. The SWIE Matrix (LRMP Appendix B) should be used to assist in assessment of this objective. In addition, the Forest Service should initiate habitat improvements in the other ACS Priority Subwatersheds as identified by WARS. The strategy to achieve this objective should include steps to coordinate restoration activities, and should take advantage of opportunities to pool funding (within Forest Service, and among other sources including NOAA) across administrative boundaries to accomplish top priority restoration projects."

Over the last five year restoration projects have been completed in numerous subwatersheds that support listed fish species or their critical habitat. The most projects have been completed in the Little Smoky drainage in the S.F. Boise subbasin and in Alturas Lake Creek, Cabin-Vat Creek, Redfish-Little Redfish, Stanley Lake, Beaver Creek, and subwatersheds associated with the Valley Road fire in the Upper Salmon subbasin (refer to Appendix A). The following are examples of some of the work completed in the areas. In the Little Smoky drainage stream fords have been redesigned to reduce erosion and sedimentation during spring run-off and facilitate fish

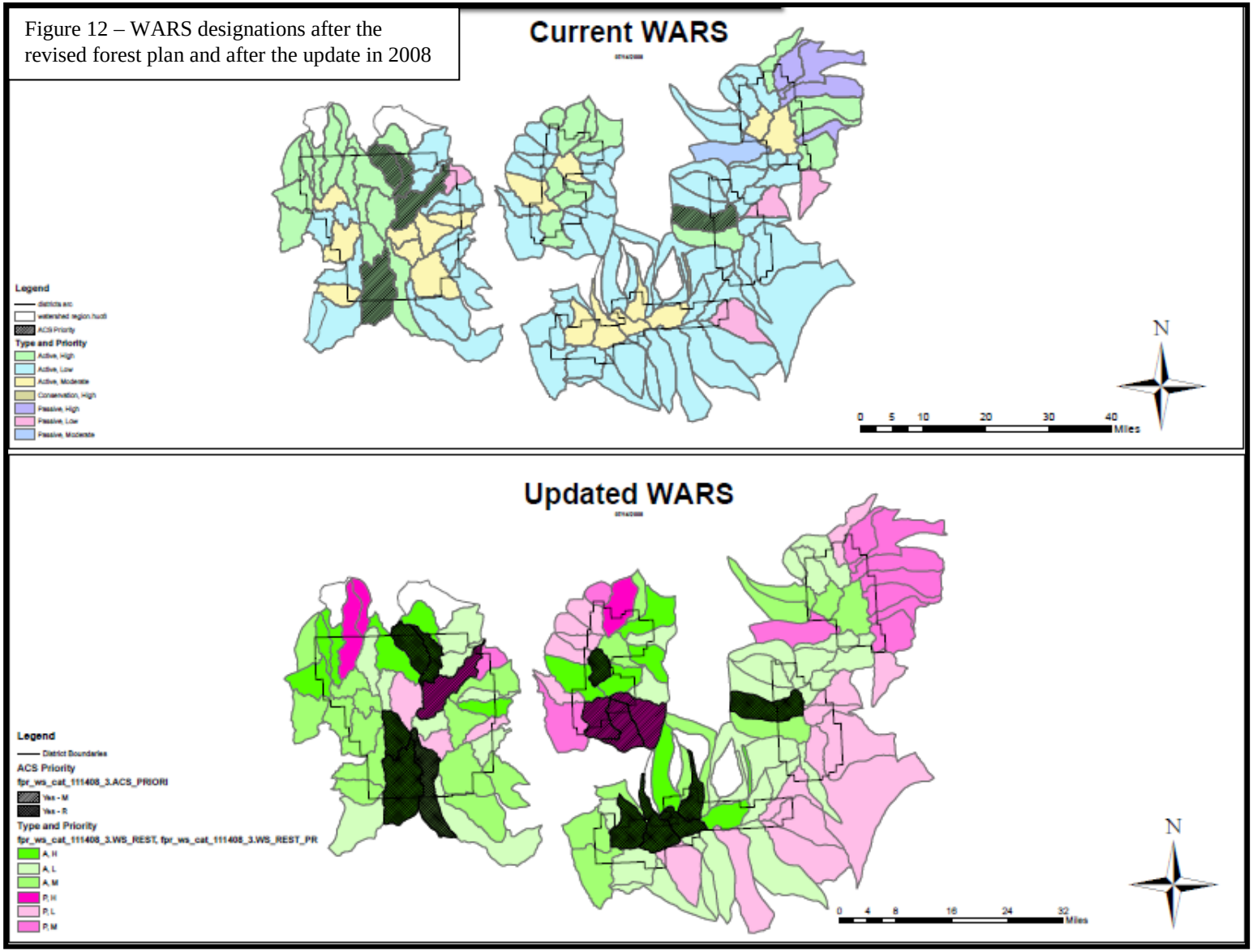
passage, beavers transplanted into several streams, closing dispersed camping sites along Little Smoky Creek, rehabilitating user created ATV trails, and woody debris placed into streams where streamside trees are at risk to theft by fuelwood cutters. In the Redfish-Little Redfish subwatershed projects have been implemented to limit recreational impacts on lakeshore banks, soils, and riparian vegetation by constructing wood fences, revegetating portions of the shoreline, and repairing/hardening areas along boat docks by installing stairs and handrails. Finally, in the Cabin-Vat subwatersheds projects have closed user created ATV routes, removing an abandoned irrigation diversion from Cabin Creek, remove roads to restore wetlands and upland areas by re-establishing the natural drainage, removing road fill, and compacting soils, and filling in diversion ditches.

WARS Strategy

SWOB09 - Using watershed condition indicators (refer to Appendix B), update the environmental baseline biennially when new information is available through sources such as subbasin assessments, mid- or project-scale analysis, inventories, or Forest-wide monitoring. Use this information to update the Watershed and Aquatic Recovery Strategy.
SWOB17 - Biennially, maintain and update the Watershed and Aquatic Recovery Strategy (WARS) using the Watershed and Aquatic Recovery Strategy prioritization process, or other appropriate methodologies.
TEOB08 - Maintain and update the Watershed and Aquatic Recovery Strategy for restoration of TEPC aquatic species habitat. Update the plan biennially by using the Watershed and Aquatic Recovery Strategy prioritization process, or other appropriate methodologies.

The WARS strategy was updated in 2008 using a combination of criteria from when the forest plan was revised (i.e. geomorphic and water quality integrity) and newer criteria (i.e. population and physical matrix indicator pathways) that was agreed to by the Ecogroup in 2006. Existing baseline data for each subwatershed was evaluated against these criteria to determine restoration priority and type. Restoration determinations were then reviewed by fisheries and hydrology staff on each district to see if the update reflected what they knew about the area. Once an agreement was reached, restoration determination were finalized and included in the forest aquatic geodatabase. Figure xx show the difference between the restoration priorities and determination made in 2003 vs. those made in 2008.

Figure 12 – WARS designations after the revised forest plan and after the update in 2008



Criteria used to revise WARS

Restoration Type

Table 5 - Matrix to Determine Appropriate Type of Subwatershed Restoration

GI	WQI	Restoration Type	If Highly Vulnerable
High	High	Passive or **Conservation** if Aquatic stronghold present	Passive or **Conservation** if Aquatic stronghold present
Moderate	High	Passive	Active
Low	High	Active	Active
High	Moderate	Passive	Active
Moderate	Moderate	Passive	Active
Low	Moderate	Active	Active
High	Low	Active	Active
Moderate	Low	Active	Active
Low	Low	Active	Active

Table 6 - Matrix to Determine Appropriate Type of Subwatershed Restoration

Population Pathway	Physical Pathways	Restoration Type
FA	FA	Passive or **Conservation** if Aquatic strong population is present
FR	FA	Passive *
FUR	FA	Passive *
FA	FR	Active
FR	FR	Active
FUR	FR	Active
FA	FUR	Active

FR	FUR	Active
FUR	FUR	Active

* Most subwatersheds were found to have some level of past or current management activities. The effects of these activities need to be field verified to determine if a passive restoration approach (e.g. limited capital investment and natural rate of recovery) is most appropriate for the overall subwatershed.

Restoration Priority

High Priority: = those subwatersheds that contain the strongest local population(s) in the subbasin for chinook salmon, sockeye salmon, steelhead trout, bull trout, or native cutthroat trout as determined by Framework or other assessments
OR
Anadromous Fish Spawning or Rearing Habitat
OR
Highly Isolated Local Population of bull trout or native cutthroat trout,
OR
TMDL Watershed Restoration Plan in place, 303 (d) present and Overall Water Quality Pathway is in a "FA" or "FR" condition.

Moderate Priority: = those subwatersheds that contain any "current presence" of anadromous species and bull trout, including migratory habitat (sockeye, chinook, steelhead, and bull trout)
OR
Those subwatersheds that contain any "current presence"* of native cutthroat trout species
OR
Designated Critical Habitat for Snake River sockeye, steelhead, and chinook salmon **303(d) Water Quality Impaired water body,
OR

Those subwatersheds that contain portions of a municipal supply watershed.

Low Priority = all remaining subwatersheds.

*Current Presence – For anadromous, bull trout species this includes migratory corridors (WARS database codes 1, 2, 3 and 4). For native cutthroat no migratory corridors have been identified in the database therefore the following are the appropriate codes (database codes 1, 2 and 4).

** Designated Critical Habitat - identified by – National Marine Fisheries Service.

Identification of the Aquatic Conservation Strategy Priority Subwatersheds

Criteria used to select ACS priority subwatersheds were as follows:

1. Subwatersheds identified for a "conservation" restoration strategy automatically became ACS priority subwatersheds.
2. ACS priority subwatersheds had to be hydrologically linked to either a strong or depressed population of listed species (except in the subbasins without listed fish species; then selection incorporated native cutthroat trout, wood river sculpin or redband trout) and have the potential to support refounding.
3. In subbasins where listed fish species have limited distribution or are absent entirely, emphasis was placed on identifying the subwatersheds with the best aquatic habitat adjacent to those occupied by listed or sensitive fish species.
4. Subwatersheds with strong or isolated local populations that have a high or moderate amount of risks and threats from anthropogenic sources automatically became ACS priority subwatersheds.
5. There was a conscious attempt to develop a network of well-dispersed ACS priority subwatersheds within the subbasin to help limit the potential impacts of stochastic events on listed fish populations.
6. Recognition that restoration (ACS-R) would be more effective if a full spectrum of activities were focused on a feasible amount of subwatersheds (2-5 per subbasin) within the planning period (10-15 years).
7. Those subwatersheds that have strong populations, but have low risks and threats, are assigned an ACS priority for maintenance (ACS-M), versus restoration within the planning period (10-15 years).

SWOB12 - Design and implement management actions so they do not fragment habitat for native and desired non-native fish species. Restore connectivity in currently fragmented habitat where the risk of genetic contamination, predation, or competition from exotic fish species is not a concern.
FROB11 - In the Forest's annual program of work, prioritize and schedule improvements to existing culverts, bridges, and other

stream crossings to accommodate fish passage, 100-year flood flow, and bedload and debris transport. Include accomplishments in the biennial update of the Watershed and Aquatic Recovery Strategy (WARS) database.

A number of projects have been completed over the five year monitoring period that address fish passage flood flows, and bedload movement (refer to Appendix A for a complete list of projects). In 2003 and 2004, approximately 500 stream crossings were inventoried on the Sawtooth National Forest. The purpose of the culvert inventory was to better describe the extent of culvert barriers across the forest to fish and associated aquatic species. The emphasis was to first focus on those streams with listed bull trout, cutthroat trout, steelhead trout, and anadromous salmon. Another objective was to prioritize culverts needing restoration taking into account extent of habitat blocked, habitat quality, importance of stream, etc. Approximately 70% of these culverts are barriers to fish passage.

Figure 13 – S.F Soldier crossing before replacement

Figure 14 – Installed bridge a S.F. Solider crossing

Several fish barrier culverts have been completed removed when the road is no longer needed or replaced with larger culverts or bridges. In 2004, a culvert was replaced with a bridge on the S.F. Soldier Creek (Figures 13 and 14). This project restored fish passage to Wood River sculpin and native redband trout to several miles of streams and reduced a chronic sediment source. In 2005 a culvert was removed from Salt Creek to restore upstream fish passage at an old logging road crossing. Removal of the culvert provided access to two miles of habitat in Salt Creek. In 2006 a culvert was removed from Big Water Gulch Creek to restore upstream fish passage to two miles of stream. The perched round 48"

diameter culvert was replaced with a round 120" diameter culvert. The new culvert was countersunk about 5 feet and filled with appropriate substrate to simulate a natural stream channel.

Stream fords have been addressed across the forest when roads have been decommissioned or fords redesigned. A few projects of interest include the redesign of fords in Little Smoky and Emma Creeks. At the Little Smokey crossing the ford was reconstructed in conjunction with a realignment of the stream channel. A new stream channel was excavated downstream of the ford to eliminate most of the existing road-stream overlap and the ford was graded and hardened to minimize the potential for recapture of the creek. In 2007, fords on FR 079 road of lower Emma Creek in the S.F. Boise subbasin were reconstructed to reduce sedimentation of habitat and improve access during low flows.

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